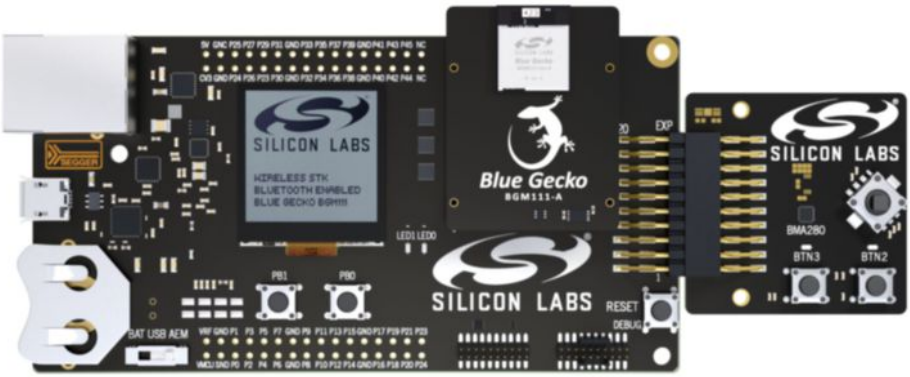
QSG107: SLWSTK6101A/B Quick-Start Guide

The Blue Gecko *Bluetooth* Smart Wireless Starter Kit is meant to help you evaluate Silicon Labs' Blue Gecko *Bluetooth* Smart modules and get you started with your own software development.

This Wireless Starter Kit includes either one of two Radio Boards. SLWSTK6101A contains the BRD4300A Radio Board with the Blue Gecko BGM111 *Bluetooth* Smart module whereas the SLWSTK6101B contains in addition also the BRD4301A with the Blue Gecko BGM113 *Bluetooth* Smart module. Both the BGM111 and BGM113 have the same factory installed demo application software installed in them. This quick-start guide includes instructions on how to test the built-in demo application using an Android or an iOS mobile phone together with the WSTK and a Radio Board.

The Silicon Labs Blue Gecko SDK available as a free download from the Silicon Labs web enables the flashing of BGM111 and BGM113 modules with further demo applications contained in the SDK or with your own software projects.



WSTK KIT FEATURES

- BRD4300A (SLWSTK6101A/B)
- BRD4301A (SLWSTK6101B)
- Common Main Board Features
  - Ethernet and USB connectivity
  - SEGGER J-Link on-board debugger
  - Debug Multiplexer supporting external hardware and the Radio Board
  - Silicon Labs' Si7021 Relative Humidity and Temperature sensor
  - Ultra low power 128x128 pixel Memory LCD
  - 2 x Push button / LED
  - Reset button
  - 20-pin 2.54 mm header for expansion boards
  - Breakout pads for direct access to all radio I/O pins
  - Power sources
    - USB
    - CR2032 coin cell battery

EXPANSION BOARD FEATURES

- Accelerometer
- Buttons and LEDs
- Joystick
- I^2C expansion

ORDERING INFO

- SLWSTK6101A
- SLWSTK6101B

KIT CONTENTS

- BRD4001A Main Board
- BRD4300A Radio Board [1, 2]
- BRD4301A Radio Board [2]
- Expansion Board
- USB cable
- CR2032 battery

1 = SLWSTK6101A

2 = SLWSTK6101B

SOFTWARE SUPPORT

- Blue Gecko *Bluetooth* Smart Software
- Blue Gecko *Bluetooth* Smart SDK
- Factory demo application
- Example applications in SDK
- iOS and Android applications
- PC tools

1. Preparing the WSTK

1. Connect a *Bluetooth* Smart Module Radio Board to the WSTK Main Board as shown in the figure below.

   Note: WSTK6101A includes only one Radio Board while WST6101B includes two.

2. Connect the WSTK to a PC using the ***"Main Board USB"*** connector.
3. Turn the **Power switch** to **"AEM"** position.

Note: At this stage you might be prompted to install the drivers for the WSTK Main Board but you can skip this for now.

Verifying the Setup

1. Check that the blue ***"USB Connection Indicator"*** LED turns on or starts blinking.
2. Check that the Main Board LCD display turns on and displays a Silicon Labs logo.

Before starting to test the demo application functionalities note the following parts on the WSTK Main Board

1. Note the location of the **Temperature & Humidity Sensor**.
2. Note the location of **PB1** and **RESET** push buttons.
3. Note the location of **LED0**

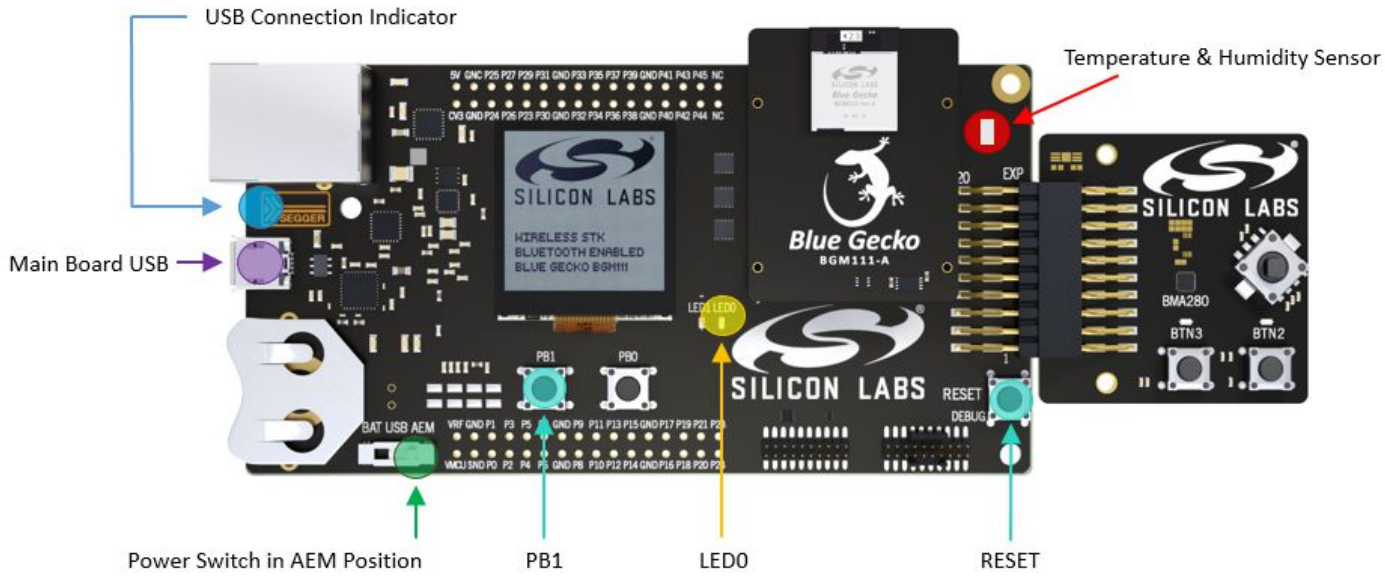


Figure 1.1. WSTK Main Board with a Radio Board and the Expansion Board Attached

2. Try the Built-in Demo Using an Android Mobile Phone

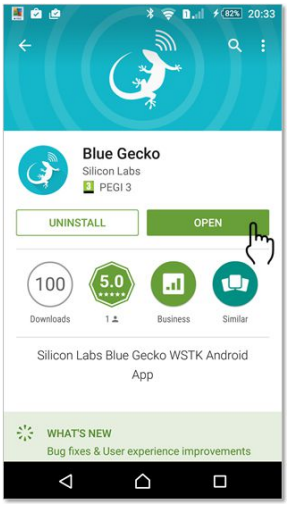
1. Installing and Launching the Silicon Labs "Blue Gecko WSTK Android App"

Step 1

Download the Silicon Labs **"Blue Gecko"** App for Android from Google Play Store. Select `Install` to install the App on your Android mobile phone.

Step 2

Open the **"Blue Gecko"** App by selecting the `OPEN` icon.



Step 3

The main menu of the **"Blue Gecko"** App will open.

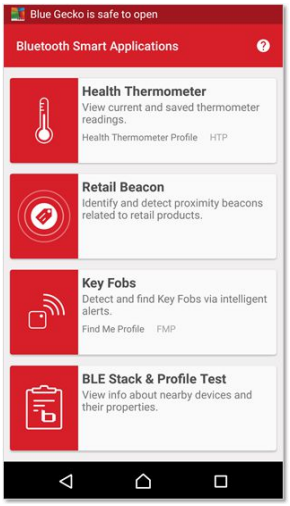
The **"Blue Gecko"** App consists of three demos selectable from the main menu of the App:

- ***Health Thermometer***
- ***Retail Beacon***
- ***Key Fobs***

The fourth option in the main menu of the **"Blue Gecko"** App is called ***BLE Stack & Profile Test*** which enables scanning for *Bluetooth* Smart devices. It lists the MAC Address, RSSI value and some other details of the detected devices.

Before starting to test any of the demos using the **"Blue Gecko"** App make sure that you have attached either the BGM111 or BGM113 Radio Board on to the WSTK Main Board connectors and that you have set up and switched on your WSTK Main Board as instructed earlier in this guide.

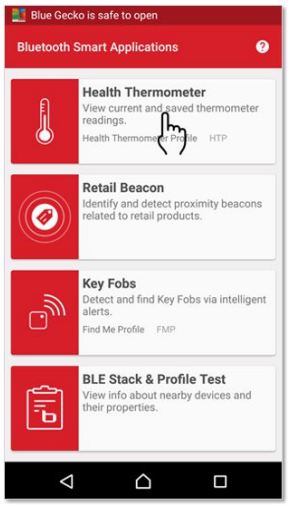
The firmware inside the BGM111 / BGM113 module on the Radio Board will default to the **Health Thermometer** part of the demo after powering up the WSTK Main Board.



2. Running the Health Thermometer Demo

Step 1

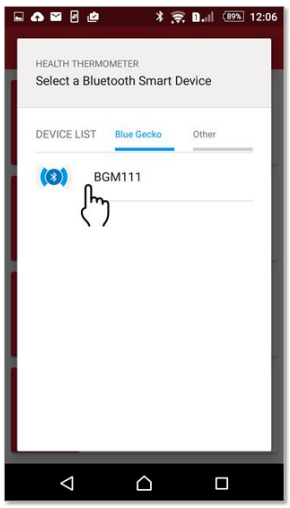
Select the **Health Thermometer** option from the **"Blue Gecko"** App main menu.



Step 2

A screen opens up and your Blue Gecko device (BGM111 or BGM113) should appear listed in the DEVICE LIST.

Select your device (BGM111 or BGM113)

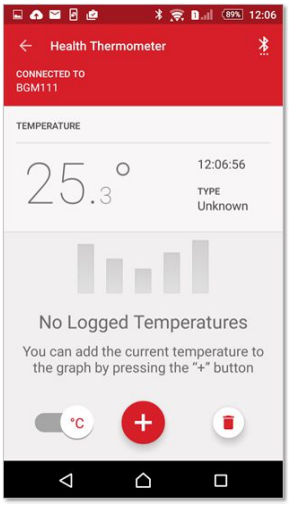


Step 3

The **Health Thermometer** screen appears.

Current temperature reading from the WSTK Temperarure & Humidity sensor is displayed.

Select preferred temperature units with slide button **"°F/°C"**.

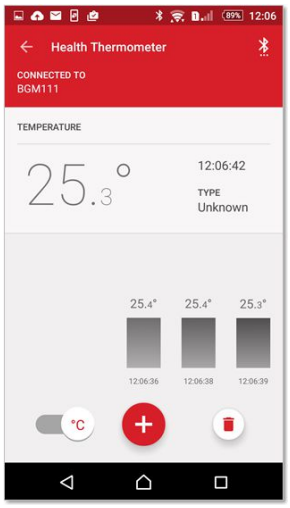


Step 4

Add the current temperature as a bar graph indicator with the temperature value shown numerically by pressing the **"+"** button.

Add a few readings to test this feature by pressing the **"+"** button.

Clear the bar graph readings by pressing the **"Trashcan"**symbol.

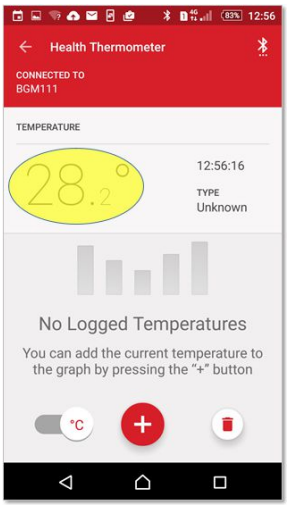


Step 5

Test the temperature sensor by pressing your finger on top of the sensor on the WSTK Main Board as shown in figure.

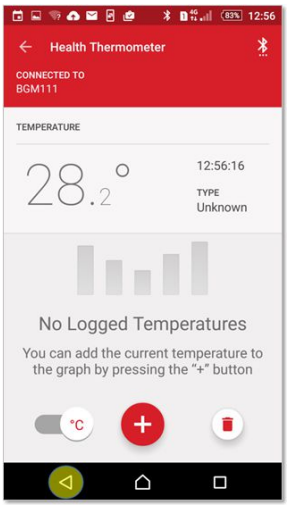
The temperature reading should change.

Verify that the temperature reading changes



Step 6

Return to the **"Blue Gecko"** App main menu by pressing twice the ← button on the menu bar at the bottom left hand side of the main menu screen.



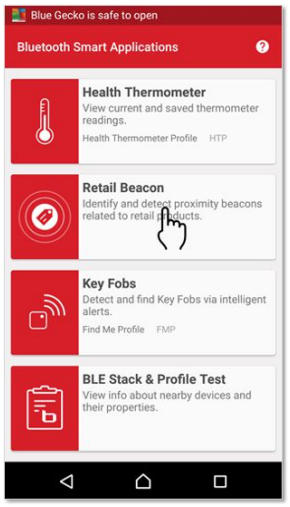
3. Running the Retail Beacon Demo

Step 1

Select the **Retail Beacon** option from the **"Blue Gecko App"** main menu.

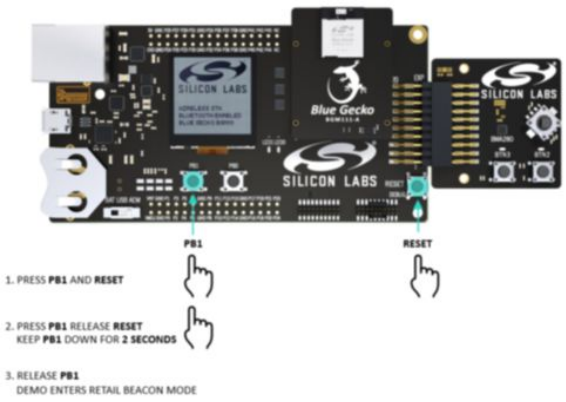
The App will start to scan for beacons and displays detected beacons as a list.

BGM111 / BGM113 is not listed at this point.



Step 2

Press both the **Reset** and **PB1** push buttons on WSTK Main Board simultaneously down and then first release the **Reset** button and keep the **PB1** button pressed down for a few seconds more and finally release also **PB1** to set the firmware in BGM111 / BGM113 into **Retail Beacon** mode.



Step 3

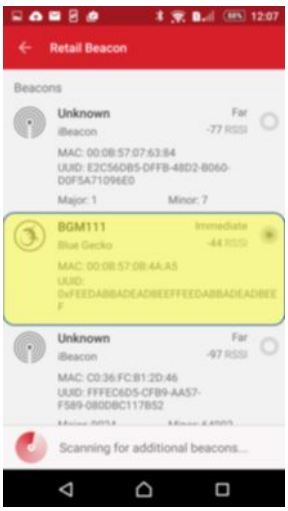
BGM111 / BGM113 will appear in the detected **Beacons** list on the **"Blue Gecko"** App screen.

The App displays the detected device's friendly name ("BGM111" or "BGM113"), the MAC address and UUID.

Also displayed is the RSSI numerical value.

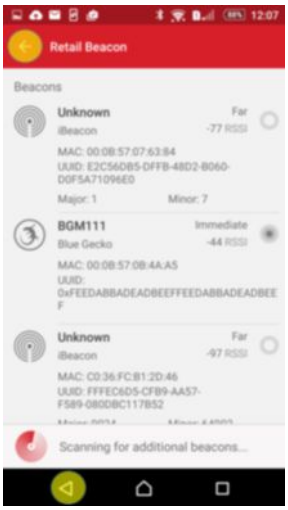
A graphical symbol and text ("Far" / "Immediate") indicates whether the beacon and the mobile phone are close to each other or further apart.

If you select the beacon a small info screen (not shown here) opens which also shows the TX value of the beacon device.



Step 4

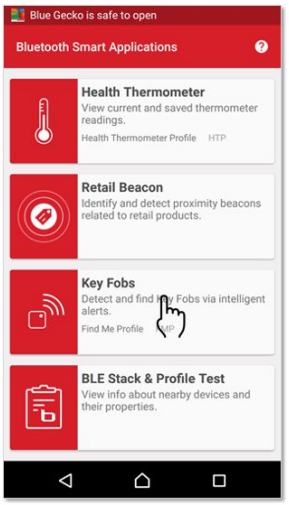
Return to **"Blue Gecko"** App main menu by pressing once either the ← icon on the top left hand side of the screen or the ← button on the left hand side of the bottom menu bar.



4. Running the Key Fobs Demo

Step 1

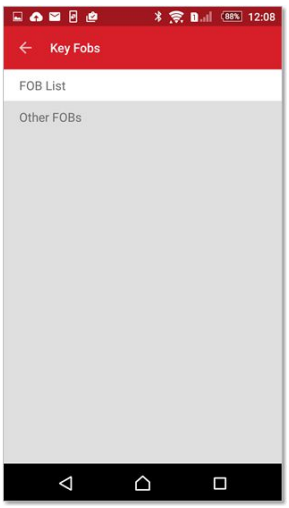
Select the **Key Fobs** option from the **"Blue Gecko"** App main menu.



Step 2

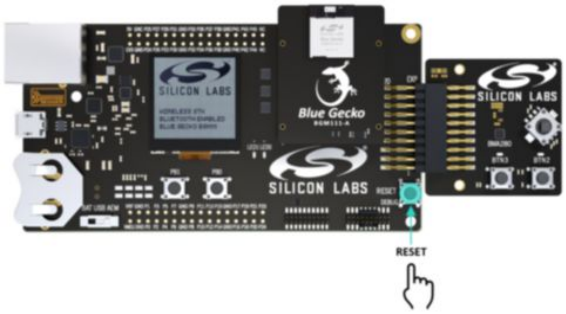
The **"Blue Gecko"** App will start to scan for a Key Fobs.

BGM111 / BGM113 is not listed at this point.



Step 3

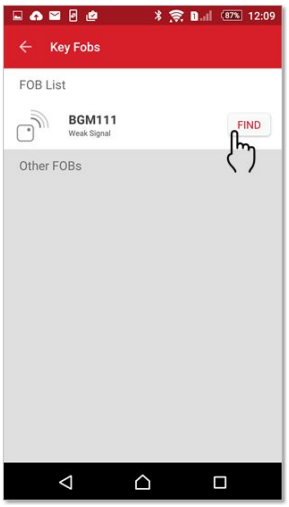
Press the **Reset** push button on WSTK Main Board momentarily down to select the **Key Fobs** part of the firmware in BGM111 / BGM113.



Step 4

BGM111 / BGM113 should appear in the **FOB List**.

Press the `FIND` button on the mobile device screen to connect with BGM111 / BGM113.



Step 5

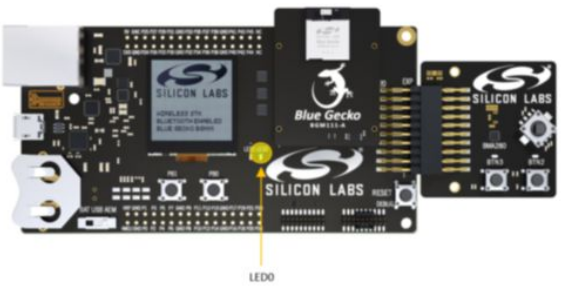
Key Fobs screen will open.

Note: Contrary to the text on the **"Blue Gecko"** App screen the flicker frequency of the "LED" on the screen does not change according to the proximity. This is due to the fact that the BGM111 / BGM113 **Key Fob** functionality is not based on the RSSI value in the initial version of the BGM111 / BGM113 firmware.

Step 6

Verify that **LED0** on the WSTK Main Board is ON.

LED0 will be ON as long as the mobile phone with the App and the Key Fob (BGMA111 / BG113) are connected and will turn OFF when the connection is lost.



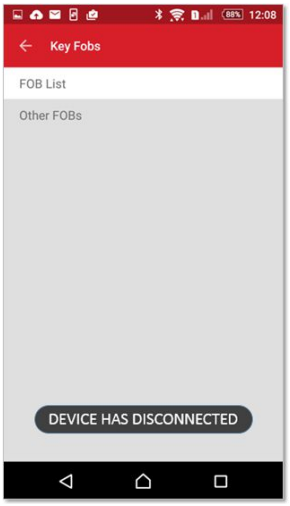
Step 7

Test the **Key Fob** functionality by walking away from the WSTK Main Board until

- the **"Blue Gecko"** App screen indicates that the connection is lost by displaying the message *"DEVICE HAS DISCONNECTED"* on the bottom part of the screen, and
- **LED0** on the WSTK Main Board turns OFF (see figure in **Step 5**).

Walk back towards the WSTK Main Board until BGM111 / BGM113 appears again on the **FOB List** on the **"Blue Gecko"** App screen.

Press the `FIND` button and verify that BGM111 / BGM113 and the **"Blue Gecko"** App are again connected and that **LED0** turns back ON.



How to continue?

1. You can test the same demo functionalities using an iOS mobile phone as instructed in the next section.
2. Follow the instructions listed at the end of this document on how to download the Silabs Blue Gecko SDK from the Silicon Labs web site. The SDK contains further examples to try out and the tools and docmentation required when making your own applications.

Technical Support

If you need further assistance and can not find the answer from the Silicon Labs' Knowledgebase you can contact Silicon Labs Technical Support through a web page.

Technical Support web link: www.silabs.com/support/

3. Try the Built-in Demo Using an iOS Mobile Phone

1. Installing and Launching the Silicon Labs "Blue Gecko WSTK App"

Step 1

Download the Silicon Labs **"Blue Gecko WSTK App"** for iOS from Apple App Store Store.

Select the download icon to install the App on your iOS mobile phone.

Step 2

Open the **"Blue Gecko WSTK App"** by selecting OPEN icon .

Step 3

The main menu of the **"Blue Gecko WSTK App"** will open.

The **"Blue Gecko WSTK App"** consists of three demos selectable from the main menu of the App:

- ***Health Thermometer***
- ***Retail Beacon***
- ***Key Fobs***

The fourth option in the main menu of the App is called ***BLE Stack & Profile Test*** which enables scanning for *Bluetooth* Smart devices. It lists the MAC Address, RSSI value and some other details of the detected devices.

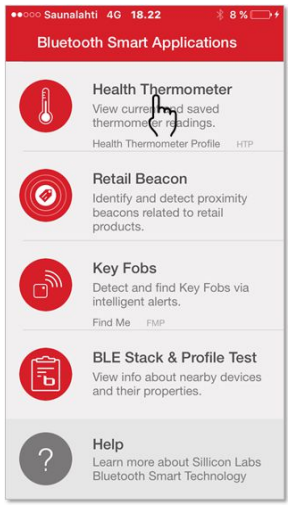
Before starting to test any of the demos using the **"Blue Gecko WSTK App"** make sure that you have attached either the BGM111 or BGM113 Radio Board on to the WSTK Main Board connectors and that you have set up and switched on your WSTK Main Board as instructed earlier in this guide.

The firmware inside the BGM111 / BGM113 module on the Radio Board will default to the **Health Thermometer** part of the demo after powering up the WSTK Main Board.

2. Running the Health Thermometer Demo

Step 1

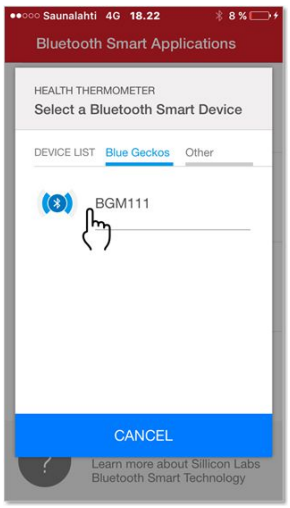
Select the **Health Thermometer** option from the **"Blue Gecko WSTK App"** main menu.



Step 2

A screen opens up and your Blue Gecko device (BGM111 or BGM113) should appear listed in the DEVICE LIST.

Select your device (BGM111 or BGM113)



Step 3

The **Health Thermometer** screen appears.

Current temperature reading from the WSTK Temperarure & Humidity sensor is displayed.

Select preferred temperature units by selecting **"°F"** or **"°C"**.

Step 4

Add the current temperature as a bar graph indicator with the temperature value shown numerically by pressing the **"+ Add to Graph"** icon.

Add a few readings to test this feature by pressing the **"+ Add to Graph"** icon.

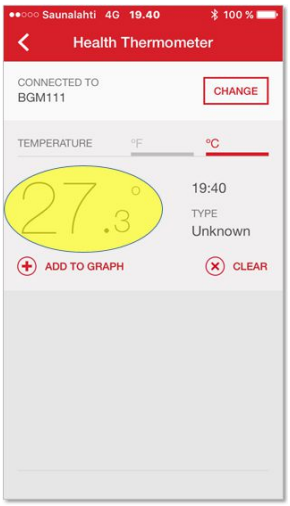
Clear the bar graph readings by pressing the **"X Clear"** icon.

Step 5

Test the temperature sensor by pressing your finger on top of the sensor on the WSTK Main Board as shown in figure.

The temperature reading should change.

Verify that the temperature reading changes



Step 6

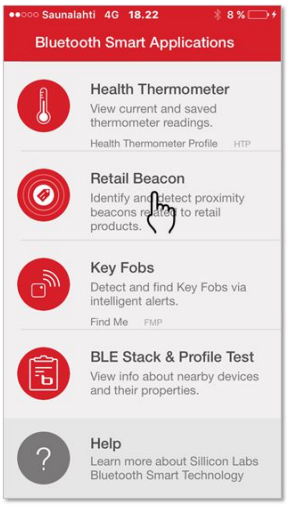
Return to the **"Blue Gecko WSTK App"** main menu by pressing the ← button on the top left part of the screen.

3. Running the Retail Beacon Demo

Step 1

Select the **Retail Beacon** option from the **"Blue Gecko WSTK App"** main menu.

BGM111 / BGM113 is not listed at this point.

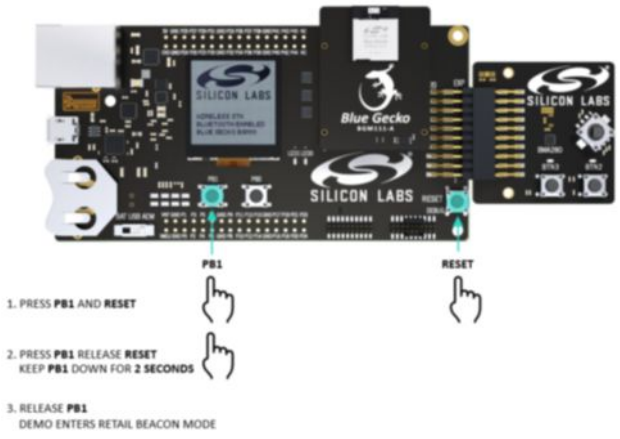


Step 2

The App will start to scan for beacons.

Step 3

Press both the **Reset** and **PB1** push buttons on WSTK Main Board simultaneously down and then first release the **Reset** button and keep the **PB1** button pressed down for a few seconds more and finally release also **PB1** to set the firmware in BGM111 / BGM113 into **Retail Beacon** mode.



Step 4

BGM111 / BGM113 will appear in the detected **Beacons** list on the **"Blue Gecko WSTK App"** screen.

The App displays the detected device's friendly name ("BGM111" or "BGM113"), the MAC address and UUID.

Also displayed is the RSSI numerical value.

A graphical symbol and text ("Far" / "Immediate") indicates whether the beacon and the mobile phone are close to each other or further apart.

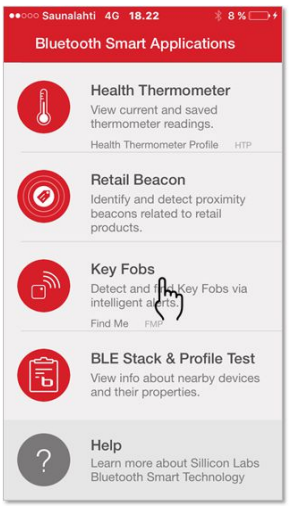
Step 5

Return to **"Blue Gecko WSTK App"** main main menu by pressing the ← button on the top left part of the screen.

4. Running the Key Fobs Demo

Step 1

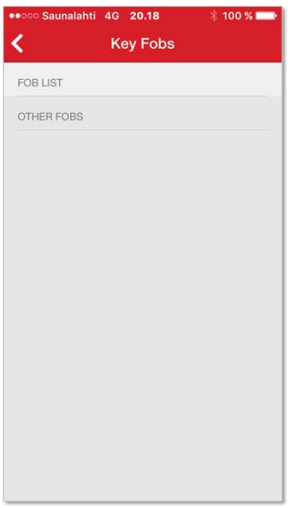
Select the **Key Fobs** option from the **"Blue Gecko WSTK App"** main menu.



Step 2

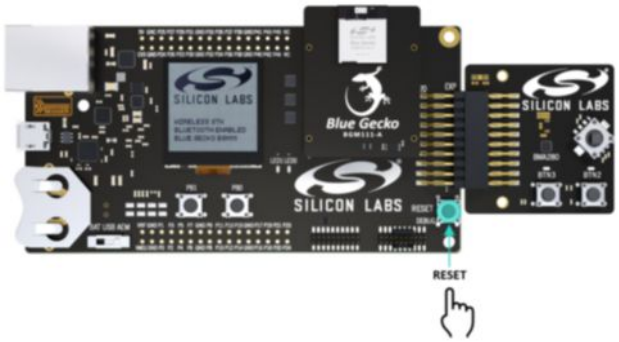
The **"Blue Gecko WSTK App"** will start to scan for a Key Fobs.

BGM111 / BGM113 is not listed at this point.



Step 3

Press the **Reset** push button on WSTK Main Board momentarily down to select the **Key Fobs** part of the firmware in BGM111 / BGM113.



Step 4

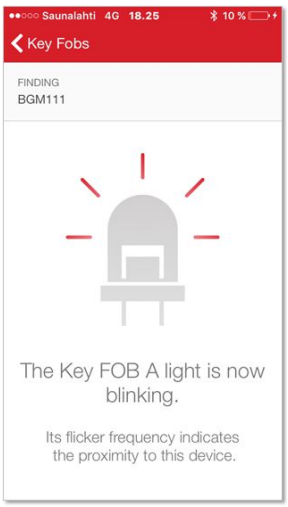
BGM111 / BGM113 should appear in the **FOB List**.

Press the `FIND` button on the mobile device screen to connect with BGM111 / BGM113.

Step 5

Key Fobs screen will open.

Note: Contrary to the text on the **"Blue Gecko WSTK App"** screen the flicker frequency of the "LED" on the screen does not change according to the proximity. This is due to the fact that the BGM111 / BGM113 **Key Fob** functionality is not based on the RSSI value in the initial version of the BGM111 / BGM113 firmware.



Step 6

Verify that **LED0** on the WSTK Main Board is ON.

LED0 will be ON as long as the mobile phone with the App and the Key Fob (BGMA111 / BG113) are connected and will turn OFF when the connection is lost.

Step 7

Test the **Key Fob** functionality by walking away from the WSTK Main Board until

- the **"Blue Gecko WSTK App"** screen indicates that the connection is lost by displaying the message *"DISCONNECTING FOB"* on the App screen, and
- **LED0** on the WSTK Main Board turns OFF (see figure in **Step 6**).

Walk back towards the WSTK Main Board until BGM111 / BGM113 appears again on the **FOB List** on the **"Blue Gecko WSTK App"** screen.

Press the `FIND` button and verify that BGM111 / BGM113 and the **"Blue Gecko WSTK App"** are again connected and that **LED0** turns back ON.

How to continue?

1. You can test the same demo functionalities using an Android mobile phone as instructed in the previous section.
2. Follow the instructions listed at the end of this document on how to download the Silabs Blue Gecko SDK from the Silicon Labs web site. The SDK contains further examples to try out and the tools and docmentation required when making your own applications.

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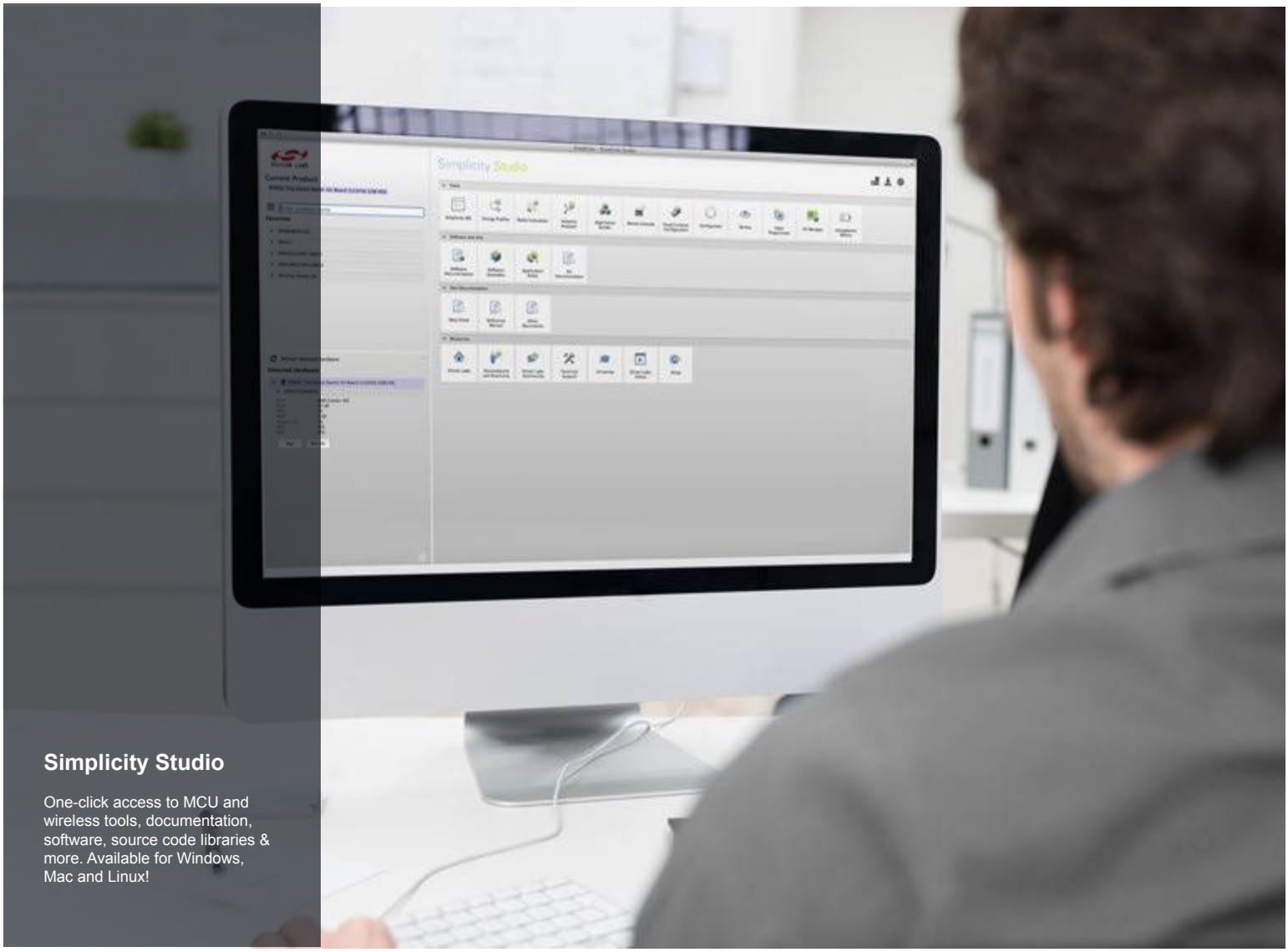
Technical Support web link: www.silabs.com/support/

4. Get Started with Your Own Development

To learn more about the Blue Gecko *Bluetooth* Smart Modules and to try other demos and examples:

- Go to: www.silabs.com/bluetooth-getstarted.
- Create an account and log in.
- Download the ***QSG108: Blue Gecko Bluetooth Smart Software Quick-Start Guide*** to learn more about the *Bluetooth* Smart software, SDK, tools and other demo applications.
- Download the ***UG122: Blue Gecko Wireless Starter Kit User's Guide*** to learn more about the Wireless Starter Kit.
- Download the ***Blue Gecko Bluetooth Smart Software Development Kit*** and install it to test the other example projects and to start developing your own applications.



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